

GB 2212004  
JUL 1989

## (12) UK Patent Application (19) GB (11) 2 212 004 (13) A

(43) Date of A publication 12.07.1989

(21) Application No 8725967.7

(22) Date of filing 05.11.1987

(71) Applicant

H &amp; L Appleby Limited

(Incorporated in the United Kingdom)

Coltham Road, Short Heath, Willenhall,  
West Midlands, WV12 5QE, United Kingdom

(72) Inventor

Cecil Maurice Appleby

(74) Agent and/or Address for Service

Forrester Ketley & Co  
Chamberlain House, Paradise Place, Birmingham,  
B3 3HP, United Kingdom(51) INT CL<sup>4</sup>

H02G 3/08

(52) UK CL (Edition J)

H2E EDG EEMB

(56) Documents cited

GB 2202294 A

GB 1371900 A

GB 1159264 A

GB 1126089 A

GB 1123476 A

GB 0972931 A

US 3824555 A

(58) Field of search

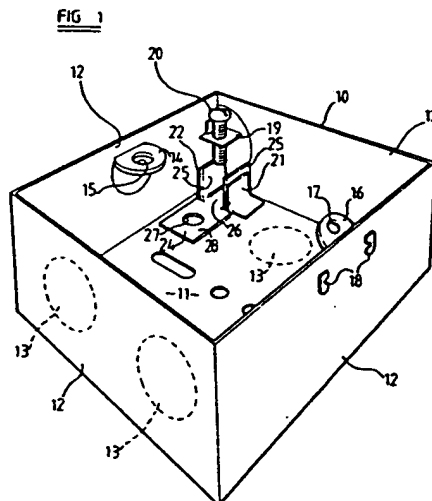
UK CL (Edition J) H2E EDCW EDG EEGF EEGG

EEGH EEGJ EEMB

INT CL<sup>4</sup> H01R, H02G

## (54) Earth terminal of accessory mounting box

(57) An electrical accessory box (10) is formed with an earth terminal, the earth terminal comprising a tab (19) adapted to receive an earth screw (20), and an insert (24) which together with the tab (19) provides a socket (26) for an earth conductor, the insert (24) being positioned so that as the screw (20) is tightened, an earth conductor in the socket is engaged by the screw (20). The insert is made of a metal in the electrochemical series between that of the conductor and that of the box.



At least one drawing originally filed was informal and the print reproduced here is taken from a later filed formal copy.

The claims were filed later than the filing date within the period prescribed by Rule 25(1) of the Patents Rules 1982.

GB 2 212 004 A

Title: "Mounting box"

Description of Invention

This invention relates to a mounting box for mounting electrical equipment by which we means electrical switches, sockets, junctions, and electrical circuits. Such electrical equipment may be provided on a face plate which is mounted on an open side of the box or on a mounting plate within the box. In the latter case, the box may comprise an open sided container having a lid.

Such boxes are conventionally made of a metal such as galvanised steel, and have an earth terminal so that the box itself, and any electrical equipment mounted by the box, can be earthed.

Such earth terminals are known which are provided by a tab which has an opening to receive an earth fixing screw, an earth conductor being trapped in a socket provided between the tab and a part of the box such as a side thereof, the conductor being retained when the screw is tightened down.

Because the box is conventionally made of galvanised steel, and an earth conductor is usually copper or copper coated, there is a risk of corrosion in the earthed joint due to the contacting dissimilar metals, particularly in a moist environment.

Accordingly it is an object of the present invention to provide a new or improved mounting box.

According to the invention we provide a mounting box for electrical equipment comprising an earth terminal, the earth terminal comprising a tab adapted to receive an earth screw, and an insert which together with the tab provides a socket for an earth conductor, the insert being positioned so that as the screw is tightened, an earth conductor in the socket is engaged by the screw.

Thus by providing the insert in a metal in the electro chemical series between the metal of the earth conductor and the metal of the box, an earth connection is achieved between the earth conductor and the insert and

hence the box which is less prone to corrosion problems than in conventional arrangements.

Preferably the insert comprises brass or another metal similar to the metal from which the earth conductor is made.

The earth screw preferably also comprises brass to at least reduce the possibility of corrosion between the screw and the earth conductor.

The insert is preferably fixed relative to the box in the position described so that even prior to tightening of the screw the insert is held rigid relative to the box. However, it will be appreciated that upon tightening of the screw, the insert will be urged into closer contact with the box and hence improve the connection between the two.

Preferably the insert includes a fixing part which is integral with the socket, the fixing part being secured to the box e.g. by riveting, but preferably the fixing part has a spigot which is received in an opening in the box and distorted for example by peening, to provide a connection.

The socket may be provided by a U-shaped formation, which may be located between a pair of retaining plates of the box such as are already conventionally provided in mounting boxes as part of the existing earth terminal.

The invention is particularly applicable to a box made of sheet metal such as galvanised steel, pressed out and bent to shape when the tab which receives the earth screw may comprise a tab integral with a side of the box e.g. at a corner thereof, when the box is rectangular or square.

The insert may thus be fixed relative to a base side of the box.

The box may include weakened regions as is well known in the art, which may easily be removed to facilitate cable entry into the box.

The invention will now be described with the aid of the accompanying drawings in which:

FIGURE 1 is an illustrative perspective view of a mounting box having an earth terminal in accordance with the invention.

FIGURE 2 is an enlarged perspective view of part of the earth terminal of the box of Figure 1.

Referring to the drawings, a mounting box 10 of the type which is intended to be embedded in a wall has a generally square base 11, from which four upwardly extending side walls 12 form the box.

An open end of the box is in use closed by a face plate mounting a switch or socket, the face plate being secured to the box 10 by means of fixings 14 and 16.

The box 10 is conveniently made as a pressing in metal and bent to shape, and the fixing 14 which has a threaded aperture 15 to receive a face plate retaining screw, is preferably stamped out of one wall 12 of the box.

The other fixing 16 which also has a threaded aperture 17 to receive a retaining screw, is movable towards and away from the base 11 and side to side, by virtue of the fixing 16 comprising a separate plate-like part which is retained by stamped out tongues 18 provided in the side wall 12 opposite to the side wall 12 on which fixing 14 is provided.

The box 10 has weakened regions as indicated at 13 which may be removed as required by an electrician to facilitate cable entry into the box.

In one corner of the box, a tab 19 is provided, which also preferably comprises part of the pressing of one of the side walls, the tab 19 having a threaded aperture to receive an earth screw 20.

Beneath the tab 19, a pair of pressed out parts 21 and 22 are provided which form between them a channel shaped socket in which conventionally, an earth conductor is received, and retained therein as the screw 20 is tightened down.

In accordance with the present invention, a brass insert 24 is received between the parts 21 and 22 and is retained in position so that when the earth screw 20 is tightened down, the earth conductor contacts the brass insert rather than the metal of the box and the insert is urged into tight engagement with the box, to improve the connection between the two.

The brass insert 24 comprises a pair of plates 25 which lie just inside parts 21 and 22, and provide between them a U-shaped socket 26 to receive the earth conductor.

A fixing part 28 extends from the plates 25, and is adapted to retain the brass insert 24 in position.

This is achieved as the fixing part 28 has a circular opening 27 the periphery of which is deformed downwardly to provide a spigot as can best be seen in figure 2.

A corresponding circular opening is provided in the base 11 of the box 10, and after the brass insert 24 is in the position shown, the spigot 27 is peened outwardly so as to retain the brass insert 24 in position.

Various modifications may be made without departing from the scope of the invention.

For example, although it is preferred for the brass insert 24 to be retained relative to the box by means of the spigot 27 described, any other

means for retaining the brass insert relative to the box 10 may be provided. It will be appreciated that once the earth conductor is in position, and the earth screw 20 is tightened down, this will in any case retain the brass insert 24 in position, although some means such as the spigot 27 is required to retain the insert 24 relative to the box prior to the screw 20 being tightened down. For example, the brass insert 24 could be riveted, or affixed in position by any other suitable means.

Although in the embodiment described, the earth terminal is provided by the tab 19 which is formed as an integral part with the pressing of the remainder of the box, if desired, a separate earth tab may be provided although the arrangement described is preferred for reasons of cost.

The insert 24 and/or screw 20, although preferably made of brass, may be made of another metal in the electro-chemical series between copper, from which the earth conductor is conventionally made, and galvanised steel from which the box is conventionally made, or the insert may be coated with brass as required.

The box 10 described is only an example of the mounting box with which the invention may be used. For example, the invention may be applied to a rectangular box intended to mount a rectangular face plate with for example, two switches or two sockets provided thereon. Alternatively, the box may have an internal mounting plate and a lid, and may be surface mounted rather than being of the embedded type described. In other applications, the box 10 may be made of a material other than metal and may be made by a method other than a pressing as described.

Where the box is made of a metal other than galvanised steel and/or the earth conductor is made of a metal other than copper, or copper coated, the insert may be made of another metal between the metals of the box and the conductor in the electro-chemical series.

The features disclosed in the foregoing description, or the accompanying drawings, expressed in their specific forms or in terms of a means for performing the disclosed function, or a method or process for attaining the disclosed result, or a class or group of substances or compositions, as appropriate, may, separately or in any combination of such features, be utilised for realising the invention in diverse forms thereof.

CLAIMS:-

1. A mounting box for electrical equipment comprising an earth terminal, the earth terminal comprising a tab adapted to receive an earth screw, and an insert which together with the tab provides a socket for an earth conductor, the insert being positioned so that as the screw is tightened, an earth conductor in the socket is engaged by the screw.
2. A box according to Claim 1 wherein the box and the insert are metallic and the insert is provided in a metal in the electro chemical series between the metal of the earth conductor and the metal of the box.
3. A box according to Claim 2 wherein the insert comprises a metal similar to the metal from which the earth conductor is made.
4. A box according to Claim 3 wherein the insert is made of brass.
5. A box according to Claim 3 or Claim 4 wherein the earth screw is made of the same metal as the insert.
6. A box according to any one of the preceding claims wherein the insert is fixed in position relative to the box whereby prior to tightening of the screw the insert is held rigid relative to the box.
7. A box according to Claim 6 wherein the insert is positioned such that upon tightening of the screw, the insert is urged closer into contact with the box to improve the electrical connection between the two.
8. A box according to Claim 6 or Claim 7 wherein the insert includes a fixing part which is integral with the socket, the fixing part being secured to the box.
9. A box according to Claim 8 wherein the fixing part has a spigot which is received in an opening in the box and distorted to provide a connection between the insert and the box.

10. A box according to any one of Claims 1 to 9 wherein the insert has a U-shaped formation.

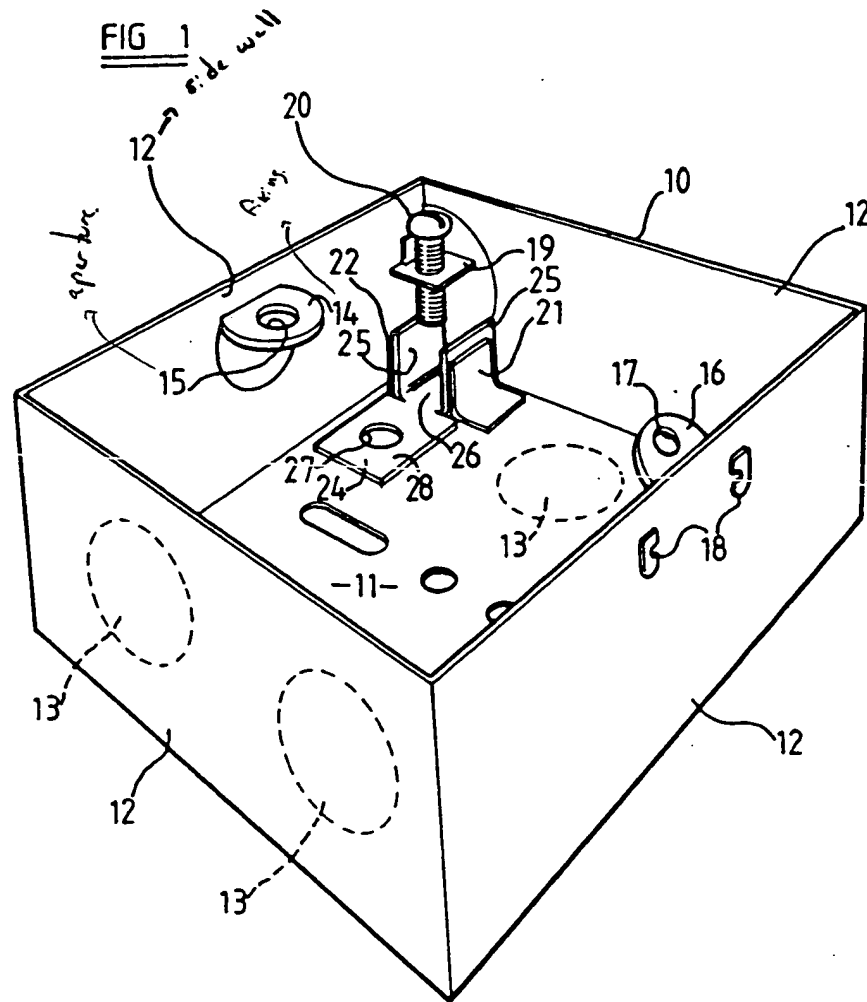
11. A box according to Claim 10 which has a pair of retaining plates beneath the tab, the limbs of the U-shaped formation of the insert being located between the plates.

12. A box according to any one of the preceding claims which is made of sheet metal pressed out and bent to shape, the tab which receives the earth screw being formed integrally with a side of the box.

13. A box according to any one of the preceding claims wherein the insert is fixed relative to a base side of the box.

14. A box substantially as hereinbefore described with reference to and as shown in the accompanying drawings.

15. Any novel feature or novel combination of features disclosed herein and/or as shown in the accompanying drawings.



**FIG 2**

